Renewable Energy 133 (2019) 23–31

Contents lists available at ScienceDirect

Renewable Energy

journal homepage: www.elsevier.com/locate/renene

Business model translation—The case of spreading a business model for solar energy

Kajsa Ahlgren Ode*, Jessica Lagerstedt Wadin

Design Sciences, Faculty of Engineering, Lund University, Box 118, 221 00 Lund, Sweden

ARTICLE INFO

Article history:
Received 24 January 2017
Received in revised form
6 October 2017
Accepted 12 September 2018
Available online 13 September 2018

Keywords:
Solar photovoltaics
Business model
Translation
Renewable energy
Entrepreneurship

ABSTRACT

Distributed solar photovoltaic systems are considered an important renewable energy source for meeting renewable energy targets and mitigating climate change. In several markets, emerging firms have established new business models to offer residential customers solar panel systems. In California, the third-party ownership business model has been successfully established during the last decade, and is currently spreading to other markets. Through a longitudinal case study, this paper explores how a startup firm in the Netherlands set up the third-party ownership business model on the Dutch market. The case shows that the process of bringing a business model to a new market is not sufficiently understood as a process of diffusion. Alternatively, it is a process of business model translation, in which the actors involved play a central role in adapting and successfully establishing the business model in a new market. The results have implications for both practitioners and policy makers, as well as the emerging literature on business models for sustainability.

© 2018 Elsevier Ltd. All rights reserved.

1. Introduction

In a number of leading markets in developed countries, emerging firms applying various business models for distributed solar energy have shown potential for bringing photovoltaic technology to the market (e.g. Refs. [1–5]) However, previous research has found that different business models for solar energy have developed on different markets, depending on the local context [1,6]. Hence, to consider a successful business model on one market to be a prototype ready to be adopted in new markets, is to neglect the potential challenges should a business model be brought to a new market [3]. Neglecting such challenges could hamper the spread of successful business models, and consequently, have a negative impact on the increase in global installed capacity.

About a decade ago, the TPO[1] business model was developed in California, in the United States [3]. With this business model, solar service firms give private homeowners the opportunity to put solar panels on their roofs at a fixed monthly rate, instead of purchasing a solar panel system up front. In addition, maintenance and guarantee clauses are included for a period of 20 years. This setup turned out to make it much easier for customers to "go solar." As the name third-party ownership business model discloses, a third party owns the solar panel system, usually an investor or a bank. Still, the solar service firm signs the deal with the customer and manages customer contact throughout the contract period. Installers are hired to install the solar panel system, and various partners assist in generating customer leads [3,4]. Recently, this successful business model for solar energy has spread to European markets, where business models based on purchase have been dominating [3].

Within the emerging business model literature, a few scholars have already touched upon the phenomenon. Researchers studying business models for solar energy have pointed to potential challenges if spreading the TPO business model to markets outside the U.S., suggesting that differing customer characteristics and environmental settings might influence its success [1,3,4]. Moreover, some business model scholars have referred to business model diffusion to explain how business models spread [7], or denoted the business model as a means to diffuse sustainable technologies to new markets [4,8,9]. However, by framing it as diffusion, scholars assume the business model, or the technology, remains unmodified as it spreads [2,10]. In response to this, Karakaya [2] presented photovoltaic technology as a dynamic innovation, an innovation with a continuously dynamic character. Adding to his contribution, the authors of this paper suggest that the business model which

* Corresponding author.
E-mail addresses: kajsa.ahlgren@design.lth.se (K. Ahlgren Ode), jessica.wadin@design.lth.se (J. Lagerstedt Wadin).

[1] Third Party Ownership.

https://doi.org/10.1016/j.renene.2018.09.036
0960-1481/© 2018 Elsevier Ltd. All rights reserved.

brings photovoltaic technology to the market has a continuously dynamic character, especially when spread between markets. This dynamic process is not taken into account when applying diffusion theory, since the business model is considered unmodified and its success dependent on market circumstances.

In this paper, authors present a case study of a startup setting up the TPO business model in the Netherlands. It turns out this was not as smooth as expected by the founders of the firm. Rather, the ups and downs of bringing the TPO business model to the Dutch market was perceived as "a solar coaster ride" by one of the founders, referring to the ups and downs of a rollercoaster ride. Hence, this paper is guided by the following research question: *How can the process of bringing a business model idea —the TPO business model—to a new market be understood?*

Existing explanations for the spread of business models within the business model (innovation) literature seem to consider the business model as a black box as it spreads. Moreover, there are few empirical studies of this phenomenon underlying attempts to understand this process theoretically. Luckily, scholars of organizational change theory have studied how ideas, in general, are brought between markets and modified as they are transferred in space and time. As an alternative to the diffusion model [11], have presented the concept "travel of ideas." It suggests that an idea that reaches a new place is never identical to its original since it is disembedded from its original setting, transferred in space and time, and embedded in its new setting through a process of translation. In this process, the actors involved and their relationships are seen as central [11,12]. In the business model literature, Amit and Zott [13] suggest using a mindful business model design as opposed to a mindless business model design, comparing the latter with business model designers "act[ing] as if they are on autopilot" (p. 340). This further highlights the influence and importance of the actors in the business model design-process. Hence, by adopting the translation perspective and the concept "travel of ideas," this paper contributes to a more nuanced explanation for the spread of business models, than when framing it as diffusion. Grounded in empirical findings, it is suggested that the TPO business model is *translated* when brought to the Dutch market. In this process, the actors involved create a new version of the business model, as parts of the original business model idea are lost, kept, and developed in translation.

In addition to this introduction, the paper consists of four sections. Section 2 provides a theoretical background, reviewing the business model and translation of ideas literature. Section 3 is a methods section, while Section 4 presents the results, explaining how the TPO business model is translated to the Dutch market and made successful there. Section 5 provides a concluding discussion, including implications for practitioners and policy makers.

2. Literature review and theoretical background

2.1. Business models

During the last 20 years, the business model has gained increased attention as a unit of analysis, both among academics and among practitioners (e.g. Ref. [14]). Zott, Amit, and Massa [15] have further pointed out that the business model offers a "holistic approach to explaining how firms do business" and an analysis different from that of the product, firm, strategy, or industry. Some scholars view the business model as a link between a new technology and the market, pointing out the business model setup is central to the spread and success of a technology [16]. Other scholars view the business model as a strategic activity system for value creation and capture [17–19]. Moreover, most scholars seem to agree that four constructs are central to the business model concept: value proposition, customer interface, revenue model, and business structure (see Fig. 1). These constructs have previously been used in relation to the literature on business models for sustainable innovations [9], renewable energy [20], and solar energy [1,4].

2.1.1. Business model innovation

Over the last years, scholars within the business model literature have acknowledged the need for business model innovation in principle [18,21], especially among incumbents as a means to overcome inertia [16,22,23], but also for new entrants to establish themselves on the market [15]. Hence, the business model has emerged as a promising unit of analysis for innovation strategy and sustainable competitive advantage.

Focusing on the development of business models over time, the business model innovation literature (also termed business model development [24], evolution [25], and change [26]), is considered especially relevant for this study.

Scholars exploring and studying the process of conducting

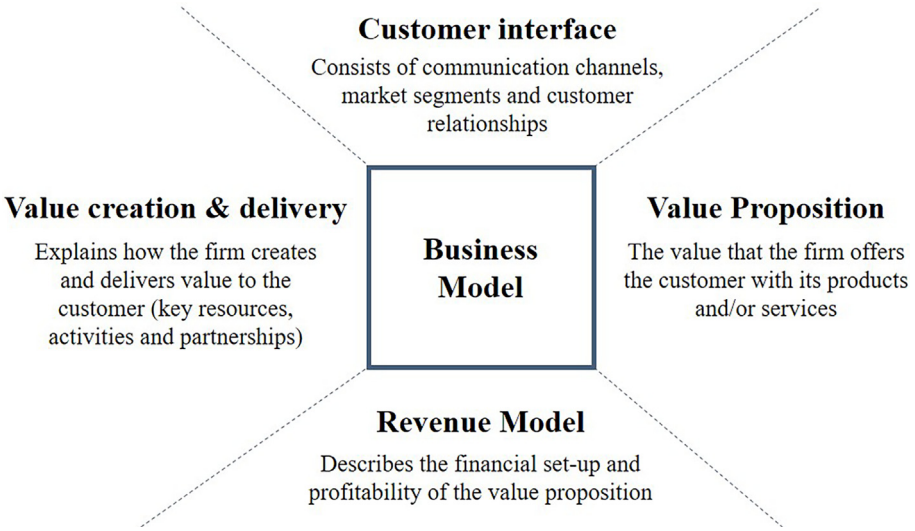

Customer interface
Consists of communication channels, market segments and customer relationships
Value creation & delivery
Explains how the firm creates and delivers value to the customer (key resources, activities and partnerships)
Business Model
Value Proposition
The value that the firm offers the customer with its products and/or services
Revenue Model
Describes the financial set-up and profitability of the value proposition

Fig. 1. Business model definition including value proposition, customer interface, revenue model, and business structure (based on Richter, 2013).

business model innovation have gained increased attention over the last years. Within this stream of literature, focus has been on business model innovation as an evolutionary process and continuous reaction to changes in the environment [25,27]; as an ongoing learning process consisting of an exploration and an exploitation phase [23]; and as a trial-and-error-based process [28] including experimentation [21,24]. Actors outside the focal firm have been pointed out to support business model innovation [29], as well as coherence between leadership, culture, and employees [26]. Moreover, Santos et al. [30] suggest business model innovation includes two systems: a system of activities and a system of relationships.

However, the above-mentioned studies are primarily based on established firms as opposed to emerging firms and startups. Scholars have pointed out business model emergence as an under-researched area, and Zott and Amit [31] have asked if they "emerge as part of an evolutionary dynamic, or are they purposefully designed by entrepreneurial actors?" (p. 407). In 2015, Amit and Zott [13] propose goals, templates, stakeholders and environmental constraints as antecedents to business model design, but once again stress the need for (empirical) studies of the process of business model design.

2.1.2. Business models for sustainability

Over the last decade, the business model concept has been introduced to the sustainability literature [32]. Some scholars argue that the business model can constitute an important link in transforming high potential sustainable ideas to marketable sustainable innovations, i.e., through business model innovation, companies can commercialize new sustainable technologies [9,33]. Other scholars discuss whether the diffusion of green technology may be hampered by established firms' current business model, and that business model innovation (for example, by offering a service rather than a product) could help spread sustainable technologies [5,17,34]. Scholars exploring business models for solar energy have shown that a business model allows photovoltaic technology to spread in a market [1,3,4,8], and that customer-oriented business models are central both among emerging and established firms [3,5,34]. However, to the authors' knowledge, scholars have not previously explored how established business models for solar energy can successfully spread between markets, and how business model innovation might come into play to increase the global installed capacity of photovoltaic technology [3,4].

2.2. The translation of ideas

As opposed to discussing idea spreading in terms of diffusion (based on the work by Rogers [10]), the literature of Scandinavian institutionalism argues that the spread of ideas is a process of translation, in which an idea is transformed to fit its new context as it spreads in space and time [11,12]. Hence, a travelling idea will not be identical with the original but rather will be a translated version of a distilled generalized abstract concept influenced by the local context in which it is embedded [35]. In a diffusion model, the actors involved in the diffusion process are neglected [36]. In contrast, the translation concept emphasizes the importance of the people spreading the idea:

> *"… the spread in time and space of anything—claims, orders, artifacts, goods—is in the hands of people; each of these people may act in many different ways, letting the token drop, or modifying it, or deflecting it, or betraying it, or adding to it, or appropriating it"* (Latour, 1986, p. 267).

Management and organizational researchers have used the concept of translation when studying phenomena related to knowledge, learning, innovation, and change. The circulation of ideas is suggested to be a consequence of the desire to imitate what are seen as "success models" [37]. Herein, ideas are disembedded from a specific context and turned into "recipes" communicated in texts, presentations, or other media forms, to be easily transferred to new settings [11]. The reasons for selecting one idea above another can be several; for example, an idea may be selected because it represents a solution to a particular problem [36]. It is argued that the intangible nature of these generalized and abstract ideas make it difficult to disentangle the roles of those who create, spread and use ideas [38]. Hence, carriers and hosts of abstract management ideas co-construct its realization in the new context, in a continuous process of adaptation [39]. In line with this reasoning, Morris and Lancaster [40] show how the lean management idea is translated, from a broad policy level to specific practices on a project level, when transferred from the manufacturing to the construction industry. Moreover, Hwang and Suarez [41] show that the same artifact (they study strategic plans and websites) can materialize differently when translated to specific organizational settings. Hence, they argue that the organization is the primary source of variation rather than the idea, i.e., the translator rather than what is being translated.

3. Methods

Using the business model literature as a stepping stone and curious to understand sustainable innovation and development, the authors conducted a pilot study exploring business models for solar energy in California and Germany [1]. During this study, the authors understood that the TPO business model was being brought by entrepreneurs from California to a number of European markets. Finding this interesting, the authors designed a single-case study of a start-up bringing the TPO business model from California to the Netherlands, an illustrative case providing a real-world example [42]. This empirical phenomenon had previously been pointed out in the literature as a topic for future research [3,4].

A case study research design was chosen since it is appropriate when a contemporary and complex phenomenon is explored, and the authors want to gain a holistic view and search for patterns in their observations [43]. In line with Flyvbjerg's [42] suggestion, the current case is selected as a deviant case to obtain information about an unusual case that is especially problematic. The case under study is the process of bringing the TPO business model to the Netherlands, explaining the challenges faced in this process by the managers of the Dutch startup despite having a direct contact with a firm applying the TPO business model in California. The authors are aware of the limitations concerning generalizations made relating to a case study design but at the same time acknowledge its unique ability to develop context-bounded knowledge based on rich empirical data [42,43].

3.1. Empirical setting

The focus of this case study is the startup Dutch Solar (fictive name), founded in the Netherlands in 2011. The reasons for choosing Dutch Solar are twofold. Firstly, it is one of the pioneers to introduce the TPO business model in a European market. Secondly, the startup's main founder has a personal relationship with a founder of one of the solar service firms in California. One could expect this relationship, involving sources of information and knowledge, to facilitate Dutch Solar's desire to bring the TPO business model to a new market. The company has gained attention in both national and international press.

Four Dutch entrepreneurs founded Dutch Solar. The main

founder has a background in renewable and solar energy and is a former colleague and long-standing friend of one of the founders of a California solar service firm, hereafter called Californian Sun (a fictive name). Dutch Solar was the first in the Netherlands to offer private homeowners solar panel systems remotely, by using a customized and proprietary ICT tool to manage the entire sales process via email and telephone. The company office is located in Amsterdam, but it operates throughout the country by collaborating with a number of regional and qualified installers.

3.2. Data collection

Inspired by the four steps of the Engaged Scholarship research process [44], the authors have iteratively visited the steps of 1) grounding and situating the problem formulation, 2) exploring a rather wide range of theoretical lenses 3) research design, and 4) presenting an answer to the research problem and question. A process study approach was chosen since it is suitable when asking and answering a "how-question" [44]. In terms of data collection, two rounds of interviews with the management team at the startup firm were arranged, complemented with time spent at the office and reading official and internal documents (e.g., PowerPoint presentations and press releases). Interview questionnaires were created based on the commonly used definition of the business model concept (i.e. value proposition, customer interface, business structure, and revenue model; see Fig. 1). Still, the interviews were semi-structured and the questions open ended (see appendix A for an example of the questionnaire) This allowed the interviewees to put emphasis on the parts they knew more about and the interviews to go beyond the four constructs defining the business model concept. In the interview conversations, the managers were asked to recollect the process of starting up the firm and bringing the TPO business model to the Dutch market. In addition to interviews with managers at the Dutch startup, interviews with two managers at the California firm are included in the data analysis. Hence, in total, the data includes 10 interviews of 1–1.5 h, which have been electronically recorded and transcribed. The interviews were held in English, but this was not considered a limitation since all members of the Dutch management team have several years of international working experience.

3.3. Data analysis

Following each visit to the case firm, early stages of analysis were carried out in conversations between the two researchers involved in the data collection. In between the interviews, the authors drew upon information from newspapers, archives, the Internet, and books to get a better understanding of the phenomenon of a spreading business model. This was all in line with Swedberg's advice that sources should be numerous and of all types [45].

Since we planned for two rounds of interviews data from the first round were analyzed before re-entering the field, giving us the opportunity to make the second round of data collection more focused [46]. The first round of analysis consisted of creating a process flowchart of how the business model had been adapted to fit the Dutch market (found in Appendix B). Langley [47] suggests visual mapping as one suitable strategy (and first step) for theorizing from process data. It was during this round of analysis that the idea of the concept of business model translation stood out as especially interesting [48]. Thus, the questionnaire focused more on translation in the second round of interviews (e.g., by digging deeper into the stories that seemed representative, stories that had a few twists and turns to them and involved many actors).

The initial stage of the second round of analyzing the data consisted of coding the transcribed interviews [46], by searching for and marking when the interviewees talked about changes of the business model. For example a change in value proposition could be coded: "leasing not considered attractive". Hence, while coding, the authors were looking for instances when the TPO business model was translated by the managers due to events both inside and outside the firm. After the initial coding, the episodes about translating the business model that stood out as surprising and dramatic to the managers, and to the researchers, were selected. From these, a story of translating the TPO business model to the Dutch market was built, with support from the codes and the process flowchart from the first round of analysis. This analytical story [49], created and told by the authors but grounded in the data, is presented as the solar coaster story in section 4.

4. Results

In 2008, the founder of Californian Sun offered his old colleague and longstanding friend, hereafter called Mrs. Solaris, the opportunity to start a Californian Sun subsidiary in the Netherlands. Mrs. Solaris did not see a viable business case on the market at the time, so she turned down the offer. However, in the spring of 2011, Mrs. Solaris realized that the price of solar panel systems had dropped dramatically over the last years. She visited her old friend in California, ready to accept the offer and determined to bring Californian Sun to the European market. In California, she found Californian Sun going through a tough period and needing to focus on the national market. Consequently, Mrs. Solaris established her own solar service firm, Dutch Solar, in the Netherlands. Then, she closed an agreement with Californian Sun to license the right to use its proprietary software tools and sales process in exchange for a minor share in her firm. Mrs. Solaris collaborated with three local entrepreneurs. Together, they decided to bring the successful TPO business model, including the leasing offer and the software tools for remote sales and design, to the Dutch market. However, they did not find the Californian Sun sales process appropriate for the new market. Rather, they thought their customers would be put off by its pushy and overly friendly attitude and tone. Therefore, Mrs. Solaris and her partners decided to apply their own, European, way of doing business and approaching customers. In theory, the four entrepreneurs were all set to meet the Dutch market; however, things turned out to be less straightforward than expected.

4.1. The software tools—developed in translation

The four founders of Dutch Solar were content and happy to have the license to use the software tools developed by Californian Sun. The tools included a CRM system to manage customers, a remote solar design (RSD) tool making it possible to design solar panel systems for potential customers without visiting their home, and the "Quote-tool" calculating an offer to the customer based on the size of the system and other parameters (e.g. interest rate, cost of hardware equipment etc.). However, using these tools on the Dutch market turned out to be trickier than expected. Initially, the CRM system was used after being translated from English to Dutch and the remote design was performed by a team in California. However, the founders of Dutch Solar decided to design and develop the essential Quote-tool from scratch. One reason for this was that Californian Sun did not provide the Dutch founders with enough detailed insight about and access to the Quote-tool for them to be able to adjust it to Dutch market parameters (e.g., electricity prices, subsidies, and interest rates). In addition, the technical expert among the founders had previous experience with a programming language different from the one used by Californian Sun. Therefore, he developed a new Quote-tool, based on the

Californian version, using his preferred programming language. About one year after founding Dutch Solar, the founders had developed their own software tools based on the tools provided by Californian Sun. This allowed Dutch Solar to initiate a leasing contract with a customer without meeting them in person and visiting their home. The leasing contract was initiated and signed over the phone.

> *"… they thought they could just transport it over the ocean and we could just simply sort of start working and translate a few things in Dutch, it was a nightmare to* do it."

> *"And so we did everything ourselves, so we rebuilt it, what we're using now we built ourselves. Rebuilt or just … on a different system. A system that he [one of the founders] knew from [his former company]"*

4.2. The leasing offer—lost in translation

Once the software tools were up and running, Dutch Solar managed to collaborate with a small, green utility. The utility already had a leasing offer on the market, but was interested in using Dutch Solar's software tools to be able to sign leasing contracts remotely (i.e., without visiting the customer before a deal is closed). Although the founders of Dutch Solar were not very convinced by the utility's leasing offer, they saw the partnership as a chance to test their software tools and to get access to customers. While interviewing 500 customers in a joint survey, the founders of Dutch Solar realized that they would not be able to provide a leasing offer attractive enough for the Dutch customer. Uncertain and short-term regulations (e.g. net-metering is extended on a year to year basis as opposed to California were net-metering is guaranteed for 20 years when installing a system [50]), smaller rooftops (compared with California), and an unwillingness to sign a 20-year leasing contract made other purchase offers on the market more attractive. In addition, the bank that initially showed interest in financially investing in a TPO business model, pulled out. Little more than a year after founding Dutch Solar, the leasing offer was lost in translation and the founders decided to pursue a purchase offer instead. Shortly thereafter, Dutch Solar opened a solar panel shop in one of the founders' backyard.

> *"And then we said, well, let's just start selling solar. It's not a dream we had, it's not the 5000 system of the lease product or whatever, let's just start selling solar panels. So on April 2012 we opened up the shop. Just put a name on the door in my back garden …"*

4.3. The crazy customer carousel—kept in translation

In addition to the software license, Dutch Solar was free to use the deliberate sales process developed by Californian Sun, the so-called crazy customer carousel (fictive name). However, initially the founders decided it was "way too American" for the Dutch market, and decided to design a gentler sales approach. It consisted of sending out a sheet presenting the costs and potential savings associated with buying solar panels, based on calculations from the Quote-tool. First, they thought customers would be so eager to go solar, they would call Dutch Solar ready to make a deal. Later, they started to follow up on potential customers, to whom they had sent information sheets. A couple of months after the opening of the backyard shop, a national-celebrity friend to one of the founders agreed to do a cover in a national newspaper about buying solar panels (her family was among the first Dutch Solar customers). This generated 2000 new leads. With five people in the backyard, teaching each other how to sell solar panel systems, Dutch Solar only had the capacity to follow up on 500 of these leads, and had a hard time converting those into sales. Then fall came, and fewer people showed interest in buying solar panels. About the same time, Dutch Solar got a new CEO, and two of the original founders left the startup. The new CEO questioned why they had not adopted the crazy customer carousel sales-process from Californian Sun since it seemed very successful and efficient. With sales being slow, the founders thought they had nothing to lose, so one of the founders went to California together with the CEO, to learn about the Californian Sun sales process. In the end, the founders decided to "mimic" Californian Sun's crazy customer carousel ("with a few changes here and there"). This meant dividing the sales team into smaller units, each responsible for and focused on their own part of the sales process. It also meant adopting an "overly friendly tone" in conversation with the customer. The solar consultant team (those following up on customers with a ready system design and contract to sign) spent at least 20 min educating the customer about solar energy and making sure the customer understood every single detail in the contract. To the great surprise of the founders, this sales approach worked, and sales started to pick up. Now, posters illustrating the crazy customer carousel are seen everywhere on the office walls, and although there have been some minor changes (e.g., no home visit before signing the contract since it is not necessary according to Dutch regulations) to the Californian Sun sales process, it can be seen as kept in translation.

> *"Like we started our sales business here in our own way, like we said, oh, this [crazy customer carousel] experience, it's way too American, you know, that's not going to work in [the] Netherlands …"*

> *"… before we didn't have all those steps, like we didn't have the TSA [initial contact with the customer to check interest and viability] and the sales [follow-up call for about 30 minutes] separate and then we exactly set it up the way they did it and it works. I mean, there's some tweaks and some little cultural differences …. "*

4.4. The solarcoaster story—a story of translating a business model idea

Section 4.1–4.3 above tells the story of how the founders adapted the original TPO business model idea to fit the Dutch market. As mentioned in section 1, one of the founders perceived these ups and downs of bringing the TPO business model to the Dutch market as "a solar coaster ride" (see Fig. 2). However, after about three years in business, there seemed to be a breakpoint. In May 2014, Dutch Solar was fully acquired by Californian Sun, giving the firm a financial stability not previously experienced. The acquisition also gave Dutch Solar a long-term utility partner, providing Dutch Solar with an even stream of customer leads. The utility has held shares in Californian Sun for a few years. Although there are still ups and downs in Dutch Solar's business, they are subtler and less steep (as illustrated in Fig. 2).

In addition to highlighting the ups and downs of translating the TPO business model to the Dutch market, the solarcoaster story illustrates how the involved actors and their relationships influence how parts of the business model are developed, lost, and kept in translation. Table 1 below summarizes how four different actors and their relationships are essential in the process of translating the business model.

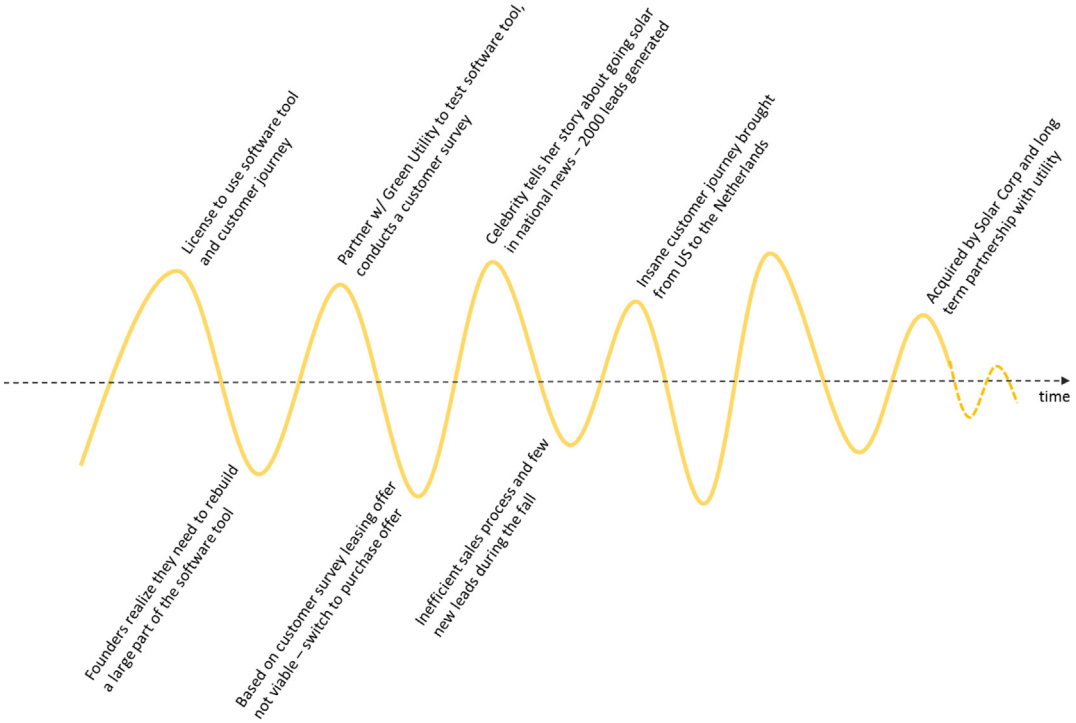

License to use software tool and customer journey
Partner w/ Green Utility to test software tool, conducts a customer survey
Celebrity tells her story about going solar in national news – 2000 leads generated
Insane customer journey brought from US to the Netherlands
Acquired by Solar Corp and long term partnership with utility
time
Founders realize they need to rebuild a large part of the software tool
Based on customer survey leasing offer not viable – switch to purchase offer
Inefficient sales process and few new leads during the fall

Fig. 2. Illustrating the ups and downs of the solarcoaster story and the central events of business model translation.

Table 1
Summary of how four central actors (founders, California Sun, employees and partners) are involved in the translation of the TPO business model.

Part of the business model being translated (incl. before and after)	Actors			
	Founders of Dutch Solar (DS)	Founders of Californian Sun (CS)	Employees of Dutch Solar	Partners to Dutch Solar
Software tools – developed in translation *Before: CRM tool, remote design tool and Quote tool* *After: CRM tool translated to Dutch. Remote design tool operated from California. Quote tool developed from scratch in a new programming language. Limited access to the code of the American tool.* *Parts of the business model changed: customer interface and business structure.*	Decide to use CS software tools. One founder has software experience from former job. Quote tool developed from scratch.	Provided license to use software tools. Occupied with national market, not prioritizing to support DS with software tools.	–	Partnership with Green Utility gave DS resources to test software tool.
Leasing offer—lost in translation *Before: The offer leasing offer had been very successful in California. Dutch Solar saw potential to set up the same offer in the Netherlands.* *After: Leasing not attractive to Dutch customers due to regulations, smaller roofs etc. Purchase offer was developed instead.* *Parts of the business model changed: value proposition, revenue model, and business structure.*	Decided to pursue purchase offer instead of leasing offer. Shop in one of the founder's backyard.	–	–	No partnership was established with investor, delaying the leasing offer. Partnership with Green Utility allowed DS to conduct a customer survey.
Crazy customer carousel—kept in translation *Before: The founders of Dutch Solar find the customer process (crazy customer carousel) too American, decide to develop their own sales approach.* *After: When sales are not picking up, Dutch Solar decides to try the American sales process and it turns out to be a success.* *Parts of the business model changed: customer interface and business structure.*	Initially turn down offer to use CS sales process. National celebrity in the personal network of one founder generates 2000 leads. New CEO questions decision to reject crazy customer carousel.	Provided license to use crazy customer carousel. Welcomed employees of DS to be trained in sales process in California. Encourage sales team (e.g., U.S. founder jumped from bridge in yellow speedos in middle of winter when sales goal was reached).	Make up the sales team, with a customer satisfaction rate above 90%. People with university degree motivated to work part-time at DS for the sustainable mission.	Long-term partnership starting in 2014 provides stable stream of customer leads.

4.5. Business models spreading between market—diffusion or translation?

This paper presents a case study of a startup bringing a business model idea—the TPO business model—from California to the Dutch market. Grounded in empirical findings, the story shows that during this process, parts of the business model are developed, lost, and kept in translation. By doing so, it illustrates that the business

model as an idea is adapted as it successfully spreads to a new market. This stands in contrast to the view among previous scholars that the business model is a static idea, where success depends only on customer characteristics and environmental settings of the new market. The story told further sheds light on the importance of the actors involved, and their relationships, when bringing the business model to the new market. As summarized in Table 1, the process was highly influenced by the founders, employees, and partners of Dutch Solar, as well as the founders of Californian Sun.

Without these people, the TPO business model might not have spread to the Netherlands, and if so, other people would most likely have contributed to developing the business model differently.

Hence, this case provides an alternative view to understand 1) how the business model is adapted as it spreads to a new market, and 2) how the people involved in this endeavor influence the process and outcome. The translation perspective stresses that an idea that is brought to a new place is never identical to its original formulation and the actors involved in the process are central. Therefore, the authors would like to propose business model translation as a more nuanced way to understand the process of bringing a business model—as an idea—to a new market. In contrast to the diffusion model, which focuses on how external factors affect the potential success of a specific and static business model idea, the notion of business model translation sheds light on the process of the involved actors adapting the business model to external circumstances, when a business model spreads between markets.

5. Conclusions

This paper presents a case that allows us to understand how a business model idea spreads to a new market. Previous research has applied the diffusion model to similar phenomena. However, based on the current case diffusion seems insufficient to understand how business models spread. Hence, the authors propose business model translation as an alternative way to understand the process, thereby including adaptations made to the original business model idea by the actors involved in establishing the business model in the new market. Although influenced by customer characteristics and environmental settings of the new market (central to the diffusion model), the success of the business model on the new market is also dependent on how the entrepreneurs involved make changes to the initial idea according to their own experiences and while adapting the original business model to its new circumstances.

Amit and Zott [13] suggest that the four antecedents —goals, templates, stakeholders, and environmental constraints—influence the business model design process. In line with this reasoning, the findings in this paper show that the business model translation process is influenced by goals (e.g., founders' goal to spread rooftop solar); a template (the original TPO business model developed in California); stakeholders (e.g., Californian Sun and utilities); and environmental constraints (e.g., smaller rooftops and regulations). Amit and Zott [13] also suggest using a mindful business model design as opposed to a mindless business model design, thereby shedding light on the centrality of the business model designers in the design process. A mindful business model designer, they argue, are “keenly borrowing from existing business model designs, recognize exactly what they are borrowing, and reflect on the appropriateness of doing so” (p.340). The solarcoaster story tells us that the founders of Dutch Solar initially anticipated the transfer of the TPO business model to be a straightforward process but ultimately realized it was a process of experimentation and adaptation. This process was highly dependent on and influenced by the founders themselves, including their experiences and relationships, as well as other actors involved in establishing the business model (e.g., employees, partners, and the media). The process of successfully bringing the TPO business model to the Dutch market was not one where the involved actors ran on autopilot. Hence, the notion of business model translation could deepen our understanding of the process of mindful business model design, especially when bringing a business model idea to a new market and making it successful there.

5.1. Implications for practitioners and policy makers

Entrepreneurs and other practitioners involved in bringing the TPO business model (or other business models) to a new market would benefit from being aware that it involves a process of translating the business model. Allowing for a period of mindful experimentation and adaptation may be central for successfully embedding a business model idea in its new market context. Moreover, the background and experience of the actors involved influence the process of translating and adapting the business model design. Policy makers need to understand that both differing policies (e.g. between nations) and the stability of policies have implications on the potential success of a business model idea as it is brought to a new market, and consequently the global level of installed capacity of solar energy. While encouraging the adoption of new business models from other markets, the need to mindfully contextualize the business model on the new market should also be communicated and taken into account. By understanding the implications that local policies have on 1) the ability of established business model ideas for solar energy to spread to a specific market and 2) how they will develop in the local energy landscape, policy makers can support and increase the locally installed capacity of solar energy.

5.2. Limitations and future research

Although this study offers an empirically rich and unique case of a business model idea being transferred between two market contexts, its generalizability is, of course, limited by the fact that it is a single case. However, as suggested by Flyvbjerg [42], the case contributes to accumulated knowledge in a multidisciplinary research stream, including management, technology innovation, renewable energy, and sustainability research. For future research, authors suggest studying several travels and translations of the same business model idea. This could lead to a more general process model of how business model ideas spread across markets. Future studies could further explore what roles the involved actors play in the translation process, to extend our understanding of how actors influence the success of the business model translation-process.

Funding

This work was supported by the Swedish Energy Agency (grant No. P 40639-1). The funding source has not been involved in designing or completing the research study.

Acknowledgements

Authors are indebted to all informants to this research, who kindly allowed us access to their time to share memories of how the TPO business model was adapted to fit the Dutch market. The authors are further very grateful to have received useful comments from two anonymous reviewers during the publication process.

Appendix A

Interview guide – Sungevity Management Team

Aim:

A. To understand business model journey from CA to NL
B. To understand business model journey from NL to GER

Focus: a management teams perspective on the adaption/innovation/change process and role of the business model as Sungevity enters a new geographical market.

Questions:

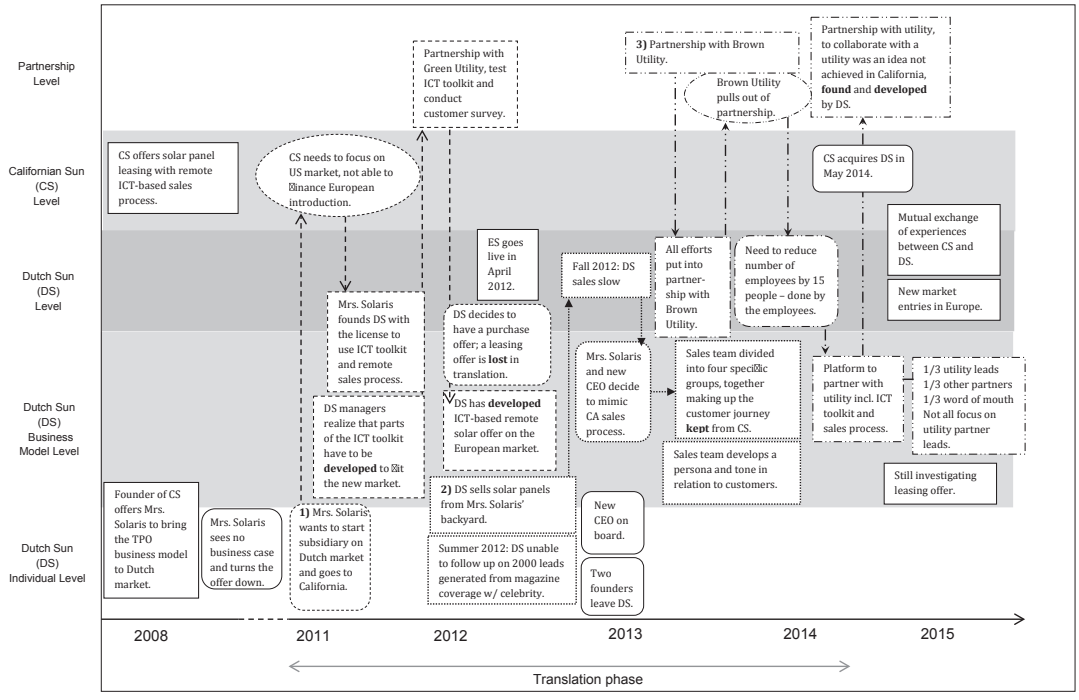
Please mark different events on a timeline (for California we have a few events marked already from the last interview).

- Decisions
- Activities
- Events outside Sungevity's control

1. Questions based on timeline:
   - Has the business structure to realize the offer to customer been changed? How? Why? (e.g. partnerships, suppliers, ICT platform)
   - Has the customer communication (channels) been changed? How? Why?
   - Has the offer to customer been changed? How? Why?
   - Has the revenue model been changed? How? Why?
2. What roles have the business model played for the management team at various points in time?
3. What factors in the Dutch business context have affected the business model adaption from California and the Netherlands?
4. Have you observed that Dutch customer attitude has been different to the American? How has this affected the business model adaption?
5. Has Sungevity affected the Dutch business context or customer attitude in any way (directly or indirectly)? Has Sungevity affected the Dutch solar energy market? How?

These questions will be repeated for each business model journey respectively.

Appendix B


Partnership Level
Californian Sun (CS) Level
Dutch Sun (DS) Level
Dutch Sun (DS) Business Model Level
Dutch Sun (DS) Individual Level
Partnership with Green Utility, test ICT toolkit and conduct customer survey.
3) Partnership with Brown Utility.
Brown Utility pulls out of partnership.
Partnership with utility, to collaborate with a utility was an idea not achieved in California, found and developed by DS.
CS offers solar panel leasing with remote ICT-based sales process.
CS needs to focus on US market, not able to finance European introduction.
CS acquires DS in May 2014.
Mutual exchange of experiences between CS and DS.
ES goes live in April 2012.
Fall 2012: DS sales slow
All efforts put into partnership with Brown Utility.
Need to reduce number of employees by 15 people – done by the employees.
New market entries in Europe.
Mrs. Solaris founds DS with the license to use ICT toolkit and remote sales process.
DS decides to have a purchase offer; a leasing offer is lost in translation.
Mrs. Solaris and new CEO decide to mimic CA sales process.
Sales team divided into four specific groups, together making up the customer journey kept from CS.
Platform to partner with utility incl. ICT toolkit and sales process.
1/3 utility leads
1/3 other partners
1/3 word of mouth
Not all focus on utility partner leads.
DS managers realize that parts of the ICT toolkit have to be developed to fit the new market.
DS has developed ICT-based remote solar offer on the European market.
Sales team develops a persona and tone in relation to customers.
Still investigating leasing offer.
Founder of CS offers Mrs. Solaris to bring the TPO business model to Dutch market.
Mrs. Solaris sees no business case and turns the offer down.
1) Mrs. Solaris wants to start subsidiary on Dutch market and goes to California.
2) DS sells solar panels from Mrs. Solaris' backyard.
Summer 2012: DS unable to follow up on 2000 leads generated from magazine coverage w/ celebrity.
New CEO on board.
Two founders leave DS.
2008
2011
2012
2013
2014
2015
Translation phase
Activity
Decision
Event outside the control of the firm
Phase 1: ICT toolkit (developed)
Phase 2: sales process (kept)
Phase 3: utility partnership (found)

Appendix 1. Illustrating the process of translating the business model to the new market in a flowchart.

References

[1] K. Ahlgren, J. Wadin, L. Bengtsson, Characteristics of customer-side business models: the case of solar energy deployment, in: Acad. Manag. 75th Annu. Meet, 2015.
[2] E. Karakaya, A Multi-level Analysis of Innovation Diffusion: the Case of Solar Photovoltaic Systems in Germany and the Disillusion of Grid Parity, KTH Royal Institute of Technology, 2015.
[3] H. Overholm, Spreading the rooftop revolution : what policies enable, Energy Pol. 84 (2015) 69–79, https://doi.org/10.1016/j.enpol.2015.04.021.
[4] L. Strupeit, A. Palm, Overcoming barriers to renewable energy diffusion: business models for customer-sited solar photovoltaics in Japan, Germany and the United States, J. Clean. Prod. 123 (2016) 124–136, https://doi.org/10.1016/j.jclepro.2015.06.120.
[5] M. Richter, German utilities and distributed PV : how to overcome barriers to business model innovation, Renew. Energy 55 (2013) 456–466, https://doi.org/10.1016/j.renene.2012.12.052.
[6] M. Provance, R.G. Donnelly, E.G. Carayannis, Institutional influences on business model choice by new ventures in the microgenerated energy industry, Energy Pol. 39 (2011) 5630–5637, https://doi.org/10.1016/j.enpol.2011.04.031.
[7] F. Ceschin, Critical Factors for implementing and diffusing sustainable product-Service systems: insights from innovation studies and companies' experiences, J. Clean. Prod. 45 (2013) 74–88.
[8] E. Karakaya, C. Nuur, A. Hidalgo, Business model challenge: lessons from a

local solar company, Renew. Energy 85 (2016) 1026–1035, https://doi.org/10.1016/j.renene.2015.07.069.
[9] F. Boons, F. Lüdeke-Freund, Business models for sustainable innovation: state-of-the-art and steps towards a research agenda, J. Clean. Prod. 45 (2013) 9–19, https://doi.org/10.1016/j.jclepro.2012.07.007.
[10] E.M. Rogers, Diffusion of Innovations, fifth ed., The free press, New York, 2003.
[11] B. Czarniawska, B. Joerges, Travels of ideas, in: Transl. Organ. Chang., First edit, Walter de Gruyter Studies in Organization, Berlin, 1996.
[12] B. Latour, The power of associations, in: Power Action and Belief, Routledge and Kegan Paul, London, 1986.
[13] R. Amit, C. Zott, Crafting business architecture: the antecedents of business model design, Strateg. Entrep. J. 9 (2015) 331–350.
[14] C. Baden-Fuller, M.S. Morgan, Business models as models, Long. Range Plan. 43 (2010) 156–171, https://doi.org/10.1016/j.lrp.2010.02.005.
[15] C. Zott, R. Amit, L. Massa, The business model: recent developments and future research, J. Manag. 37 (2011) 1019–1042, https://doi.org/10.1177/0149206311406265.
[16] H. Chesbrough, R.S. Rosenbloom, The role of the business model in capturing value from innovation : evidence from Xerox Corporation ' s technology spin-off companies, Ind. Corp. Change 11 (2002) 529–555, https://doi.org/10.1093/icc/11.3.529.
[17] R. Casadesus-Masanell, J.E. Ricart, From strategy to business models and onto tactics, Long. Range Plan. 43 (2010) 195–215, https://doi.org/10.1016/j.lrp.2010.01.004.
[18] D.J. Teece, Business models, business strategy and innovation, Long. Range Plan. 43 (2010) 172–194, https://doi.org/10.1016/j.lrp.2009.07.003.
[19] C. Zott, R. Amit, Business model design: an activity system perspective, Long. Range Plan. 43 (2010) 216–226, https://doi.org/10.1016/j.lrp.2009.07.004.
[20] M. Richter, Utilities' business models for renewable energy: a review, Renew. Sustain. Energy Rev. 16 (2012) 2483–2493, https://doi.org/10.1016/j.rser.2012.01.072.
[21] H. Chesbrough, Business model innovation: opportunities and barriers, Long. Range Plan. 43 (2010) 354–363, https://doi.org/10.1016/j.lrp.2009.07.010.
[22] S. Massa, S. Testa, Beyond the conventional-specialty dichotomy in food retailing business models: an Italian case study, J. Retailing Consum. Serv. 18 (2011) 476–482, https://doi.org/10.1016/j.jretconser.2011.06.014.
[23] M. Sosna, R.N. Trevinyo-Rodr??guez, S.R. Velamuri, Business model innovation through trial-and-error learning: the naturhouse case, Long. Range Plan. 43 (2010) 383–407, https://doi.org/10.1016/j.lrp.2010.02.003.
[24] P. Andries, K. Debackere, B. Van Looy, Simultaneous experimentation as a learning strategy: business model development under uncertainty, Strateg. Entrep. J. 7 (2013) 288–310.
[25] B. Demil, X. Lecocq, Business model evolution: in search of dynamic consistency, Long. Range Plan. 43 (2010) 227–246, https://doi.org/10.1016/j.lrp.2010.02.004.
[26] L. Achtenhagen, L. Melin, L. Naldi, Dynamics of business models - strategizing, critical capabilities and activities for sustained value creation, Long. Range Plan. 46 (2013), https://doi.org/10.1016/j.lrp.2013.04.002.
[27] B.W. Wirtz, O. Schilke, S. Ullrich, Strategic development of business models: implications of the web 2.0 for creating value on the internet, Long. Range Plan. 43 (2010) 272–290, https://doi.org/10.1016/j.lrp.2010.01.005.
[28] R.G. McGrath, Business models: a discovery driven approach, Long. Range Plan. 43 (2010) 247–261, https://doi.org/10.1016/j.lrp.2009.07.005.
[29] H. Berglund, C. Sandström, Business model innovation from an open systems perspective: structural challenges and managerial solutions, Int. J. Prod. Dev. 18 (2013) 274, https://doi.org/10.1504/IJPD.2013.055011.
[30] J. Santos, B. Spector, Toward a Theory of Business Model Innovation within Incumbent Firms, INSEAD, Fontainebleau, 2009, pp. 3–54. http://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=38708406&site=ehost-live%5Cnhttp://org.business.utah.edu/opsconf/pages/vanderHeyden_Paper.pdf.
[31] C. Zott, R. Amit, The business model: a theoretically anchored robust construct for strategic analysis, Strat. Organ. 11 (2013) 403–411, https://doi.org/10.1177/1476127013510466.
[32] W. Stubbs, C. Cocklin, Conceptualizing a "sustainable business model, Organ. Environ. 21 (2008) 103–127, https://doi.org/10.1177/1086026608318042.
[33] L. Massa, C. Tucci, Business model innovation, Oxford Handb. Innov. Manag. 20 (2013).
[34] M. Loock, Going beyond best technology and lowest price: on renewable energy investors' preference for service-driven business models, Energy Pol. 40 (2012) 21–27, https://doi.org/10.1016/j.enpol.2010.06.059.
[35] B. Czarniawska, En Teori Om Organisering, First, 2005. Studentlitteratur, Lund.
[36] B. Czarniawska, G. Sévon, Introduction, in: Transl. Organ. Chang., First, Walter de Gruyter Studies in Organization, Berlin, 1996.
[37] K. Sahlin-Andersson, Imitating by editing success: the construction of organizational fields, in: Transl. Organ. Chang, Walter de Gruyter Studies in Organization, Berlin, 1996.
[38] K. Sahlin-Andersson, L. Engwall, The Expansion of Management Knowledge: Carriers, Flows and Sources, Stanford Business Books, Stanford, CA, 2002.
[39] K. Sahlin-Andersson, G. Sévon, Imitation and identification as performatives, in: North. Light. Organ. Theory Scand., Liber, Lund, 2003.
[40] T. Morris, Z. Lancaster, T. Morris, Z. Lancaster, Translating Management Ideas, 2015, https://doi.org/10.1177/0170840605057667.
[41] H. Hwang, D. Suarez, Lost and found in the translation of strategic plans and websites, in: Glob. Ideas How Ideas, Objects, Pract. Travel Glob. Econ., First, Liber at Copenhagen Business School, Copenhagen, 2005.
[42] B. Flyvbjerg, Five misunderstandings about case-study research, Qual. Inq. 12 (2016) 219–245, https://doi.org/10.1177/1077800405284363.
[43] R.K. Yin, Applications of Case Study Research, Third, Sage Publications, Thousand Oaks, CA, 2011.
[44] A.H. Van de Ven, Engaged Scholarship: a Guide for Organizational and Social Research, Oxford University Press, Oxford, 2007.
[45] R. Swedberg, Theorizing in Sociology and Social Science : Turning to the Context of Discovery, 2012, pp. 1–40, https://doi.org/10.1007/s11186-011-9161-5.
[46] M.B. Miles, A.M. Huberman, J. Saldaña, Qualitative Data Analysis: a Methods Sourcebook, third ed., Sage Publications, Thousand Oaks, 2014.
[47] R. Dery, T.G. Hafsi Veronika Kisfalvi, rard Koenig, G. Laporte Jean Perrien, R.-A. Thietart Bob Sutton, A. Langley Universite du Quebec Montreal, tiane Demers, Strategies for Theorizing From Process Data, 1999, pp. 691–710, https://doi.org/10.5465/AMR.1999.2553248.
[48] Davis, S. Murray, That's interesting: towards a phenomenology of sociology and a sociology of phenomenology, Philos. Soc. Sci. 1 (4) (1971) 309. Philosophy. 4 (1971).
[49] C.K. Riessmann, Narrative Methods for the Human Sciences, Sage Publications, Los Angeles, 2008.
[50] N.E.A. RVO, National Survey Report of PV Power Applications in the Netherlands, 2013.